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Diffusion of Sodium in Sodium Boroaluminosilicate Glasses: Impact of Mixed Network Formers and the Influence of Water

Xinwei Wu[1], Qiuju Zheng[2], John Mauro[3], Marcel Potuzak[3], Adam Ellison[3], and Rüdiger Dieckmann[1]

[1]*Department of Materials Science and Engineering, Cornell university, Ithaca, New York, USA*
[2]*Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark*
[3]*Science and Technology Division, Corning Incorporated, Corning, New York, USA*

To investigate how the diffusion of sodium in selected sodium boroaluminosilicate glasses is influenced by variations in the network former composition, sodium tracer diffusion measurements using the radioactive isotope sodium-22 have been performed. Two series of glasses were considered, $[(Na_2O)_{0.71}(Fe_2O_3)_{0.05}(B_2O_3)_{0.24}]_{0.2}[(SiO_2)_x(Al_2O_3)_{1-x}]_{0.8}$ and $[(Na_2O)_{0.73}(B_2O_3)_{0.24}(As_2O_3)_{0.03}]_{0.18}[(SiO_2)_x(Al_2O_3)_{1-x}]_{0.82}$ with the composition parameter x varying between 0 to 1. Sodium tracer diffusion experiments were performed by diffusion annealing in dry and wet air at atmospheric pressure at different temperatures between 200 and 300 °C. The experimental results obtained will be presented and discussed.